Updating and improving of existing hydrologic and hydraulic models and configuring a Flood Early Warnings System (FEWS) in Sudan

Project Reference: CTCN 23-001

Mandatory Output 1.1 – Detailed Implementation Plan

Project Title

"Updating and improving of existing hydrologic and hydraulic models and configuring a Flood Early Warnings System (FEWS) in Sudan" (hereby referred to as the "project")

Project Objective

Strengthen the capacity of the staff of the Sudanese Ministry of Irrigation and Water Resources (MoIWR), enhance flood and droughts preparedness and early warning systems (FDPEW), and link the systems with stakeholders concerned and communities' inhabitants in flood-prone areas.

National Designated Entity (NDE)

Higher Council for Environment and Natural Resources Climate Change Directorate, Khartoum, Sudan

Project Proponent

Nile Water Department, Ministry of Irrigation and Water Resources, Sudan

Implementation Arrangements

The project will be implemented by CTCN Consortium Partner UNEP-DHI, hosted by DHI (here from in text: 'DHI').

Proposed Team Members

The team members are as detailed in Table 1 and the organisation chart is shown in Figure 1.

Table 1 Project Team members

Role	Personnel	Citizenship	Number of years of Experience	Location
Project Manager (PM)	Mekuria Beyene	German	35	Denmark
Deputy PM	Okechukwu Amogu	Nigerian / French	18	France

Role	Personnel	Citizenship	Number of years of Experience	Location
Project advisor / Quality Supervisor	Maija Bertule	Latvian / Danish	13	Denmark
Hydrologist & Flood Modelling Expert	Hans Christian Ammentorp	Danish	41	Denmark
National Flood Modeller	TBD			Sudan
Flood forecasting and Operational systems Expert	Jakob Luchner	German	10	Denmark
Gender Expert	Hawa Dahab	Sudanese	16	Sudan

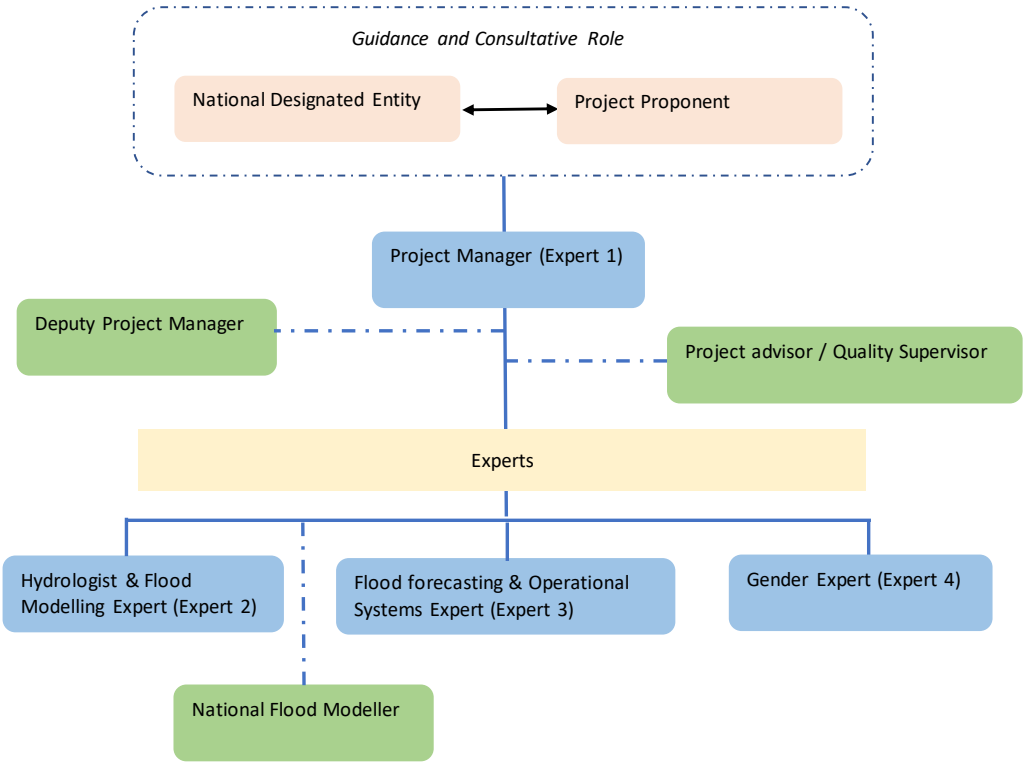

Figure 1 Proposed Organisational chart.

Note: boxes in blue mean experts are as per requirements in TA while the green boxes are additional experts considered required for the TA.

Project Timeline

Based on the project cooperation agreement (PCA) signed between DHI and CTCN, the project will be executed for a duration of 18 months from 16 February 2023 to 31 July 2024.

The detailed schedule can be viewed in Appendix 1.

Outputs and Deliverables

Mandatory Outputs

Mandatory outputs to be delivered are as follows:

1) A detailed implementation plan (this document) for all activities, deliverables, outputs, deadlines and responsible persons/organizations, including a gender study and an itemized budget for implementing the Response Plan. The detailed implementation plan and budget are included in this document and its accompanying appendices.
2) Based on the implementation plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators has been developed to evaluate the timeliness and appropriateness of implementation. The monitoring and evaluation plan accompanies this document. The indicators selected in the monitoring and evaluation plan are aligned with the technical assistance closure report template (Item v)
3) An impact statement of the CTCN technical assistance will be prepared at the start of the CTCN technical assistance and will then be updated at the end of the CTCN technical assistance. This plan will be based on a template that will be provided.
4) A closure report will be prepared at the end of the CTCN TA to be prepared using a template that will be provided. This closure plan will be based on the indicators selected in the monitoring and evaluation plan in Item ii.

Table 2 Table of Mandatory outputs

Deliverables		Delivery date
i.	Detailed Implementation Plan	12 June 2023
ii.	Monitoring & Evaluation Plan	12 June 2023
iii.	Impact description (initial version)	12 June 2023
iv.	Impact description (final version)	24 July 2024
v.	TA closure report	26 July 2024

TA Implementation Plan

The following sections outline the details of the technical assistance implementation plan.
A Gantt chart outlining all deliverables against the project timeline is attached as Appendix 1 to this document while the budget is attached as Appendix 2 to this document.

Output 1: Assessment of the existing FEWS system protocols and identifying existing data gaps and needs.

Activity 1 Stakeholder consultation, assessment of available data and existing FEWS

Activity 1.1 – Project initiation and kick-off meeting

In this activity the implementer will hold a remote kick-off meeting and formally initiate the Technical Assistance (TA), establish staff relations and communication lines at required levels. Map all relevant stakeholders that need to be involved. Evaluate risks and map these jointly with the Nile Water Department.
In addition, the technical assistance management documentation, namely, Detailed work plan, Monitoring & evaluation (M&E) plan and impact statement will be prepared as required by the TA implementation guidelines.
The result of this activity will be documented in Activity 1.3's written deliverable, the Inception Report.

Deliverables	Delivery date
Kick-off meeting	16 March 2023

Activity 1.2 – Data collection and stakeholder consultation

Consultative meetings with the Nile Water Department will be held to understand in depth the current processes/protocols for the generation, provision, management and sharing arrangements of data as well as current approach to FEWS. This is crucial so that only technology and operational practice is supplanted and does not impose restrictions on to the existing institutional framework.
It is assumed that the Sudan Nile Water Department can have access to ENTRO's forecast models and all required software licenses through the provisions of collaboration between Sudan and ENTRO.
Table 3 lists examples of data types required for the establishment of a FEWS. An assessment will be made on the availability of the data listed. An initial pre-assessment is also included in Table 3 and will be further elaborated and validated together with stakeholders.

Table 3 Required data for Technical Assistance

Data type	Accuracy	Specifications
TIME SERIES (Excel columns of date-time and value. Missing data as blanks)		
Rainfall at stations	Daily	
Satellite rainfall time series	Daily	CHIRPS and/or similar
Potential evaporation	Daily or monthly	
Water level	Hourly or daily	
Discharge	Hourly or daily	
Data at real-time reporting stations	Hourly or more frequent	All historical data available

Data type	Accuracy	Specifications
Quantitative precipitation forecasts	As available	Historical QPFs of heavy rainfall events if available
Water use	Daily	Including information on abstraction points and return flow
Reservoir water level	Daily	
Reservoir releases and estimated evaporation	Daily	
Estimated reservoir inflow if available	Daily	
Hydropower production	Hourly or daily	
PHYSICAL DATA (Excel or text files)		
River cross sections	Every 5 km or closer	Covering all possible water levels along the river, where flood forecasting is planned
Rating curves and associated discharge measurements		Including background data on validity etc.
Structure dimensions		Reservoirs, weir, bridges etc.
Operational rules for reservoirs		
GIS (shapefiles, raster)		
Rainfall stations		point layer
River stations		point layer
Reservoirs		point layer
Digital elevation model	30m or better	Hydrologically corrected if available
Land use		

The list of FEWS product end users for flood alerts will be updated by collecting information on vulnerable communities in flood-prone areas in Sudan. Sources of such information are expected to be in addition to the Nile Water Department itself, the national and local authorities, international development and aid organizations and non-governmental organizations operating in those areas. This will ensure that continued preparedness and early warning measures communication and dissemination are easily accessible to rural communities.
Based on the stakeholder mapping, consultative meetings will be held with the different organizations to inform and understand expectations about the TA and for collection of data and information from those stakeholders.
The result of this activity will be documented in Activity 1.3's written deliverable, the Inception Report.

Activity 1.3 – Inception workshop

A multi-stakeholder inception workshop will be held to understand the expectations, identify the needs, gaps, guidelines, and results and lessons learned from completed and ongoing projects to collect/generate and provide similar data/systems. The workshop will be chaired and organized by the Nile Water Department with support by the TA implementer. It is envisioned that it will be up to 1-day virtual workshop a maximum of 25 participants.

Deliverables	Delivery date
Inception workshop	14 July 2023
Inception report	04 August
Technical assistance management documentation	13 June 2023

The crisis in Sudan since April 2023 has created some disruption and therefore some delays in some of the deliverables above.

Activity 1.4 – Review of the collected data

The MoIWR is making a great effort to manage the floods by expanding and upgrading the ordinary hydrometric water level stations to automatic water level stations with fully real-time and remote transmission (telemetry system). It is assumed real-time data will be available to the TA implementer as it is not part of the TA the delivery of any monitoring equipment or new observed data.
Assuming the required data in Table 1 is available and shared with the TA team, the collected data will be reviewed for quality and gaps. Additional data collected during the stakeholder consultation activity will also be processed and reviewed.
It is recognised that these are transboundary basins and not all data is available at the national level. Depending on the agreements / data sharing protocols that are in place some of the required data may not be available. The TA Implementer will advise the Nile Water Department of the repercussions the missing data will have on the following activities and the FEWS and possible mitigation measures. Repercussions would impact the design of the enhanced system itself (including modelling framework) and ultimately operations and performance. Hydrometry (real-time and historical) time series for calibration/validation and data assimilation will be used to carry out activities relative to Output 3. Similarly, river cross-sections will be the basis for expanding the hydraulic model for the additional river reaches.
The result of this activity will be documented in Activity 1.4's written deliverable.

Activity 1.5 – Model and FEWS review

The hydrologic and hydraulic components of the existing FEWS modelling framework will be revised and the performance assessed. The forecasting and dissemination components will also be reviewed, and the technical improvements captured in an enhanced FEWS design report. The report will be presented to the client in Activity 1.6's meeting.

Deliverables	Delivery date
Enhanced FEWS design report	15 August 2023

Activity 1.6 – Capacity needs assessment

System operators will be identified, and their capacity assessed to inform the training sessions required to enable the identified staff to operate the enhanced FEWS. The results will be captured in a capacity needs assessment brief note containing the proposed training programme.
A meeting in person will take place to inform the capacity needs assessment as well as to present the deliverables of the previous activities 1.4 and 1.5, the Enhanced FEWS design report.

Deliverables	Delivery date
In person meeting	14 to 18 August 2023
Capacity needs assessment note	1 September 2023

Output 2. Enhanced FEWS

Activity 2 – Enhancement of the FEWS

Activity 2.1 – Expansion and improvement of the FEWS components

Based on the needs assessment the technical team will develop the changes to each of the FEWS components, namely the weather, hydrological, hydraulic forecasting and dissemination components. A weather forecasting system will be added to the FEWS. This translates into selecting the most suitable source for rainfall forecasts – provided access by ENTRO is given to Sudan Nile Water Department – WRF would be applied and carrying out the configuration of the system with the required automated processes.
The hydrological and hydraulic modelling framework will be improved as established in the design report. It is expected this may include for the hydrological component:

- Land use changes have occurred since the model was established and the model parameters will be dully altered to represent these changes.
- Improvement of the model to cover the Setit/Atbara basin and Dinder & Rahad basins

For the hydraulic component:

- Updates will be carried out based on recent topographic and structural information, where available
- Expansion of the model to cover the Setit/Atbara and the Dinder & Rahad rivers

This work will be followed by the calibration and validation with the historical time series collected, and implementation of a data assimilation procedure depending on real time data available and collected (Table 3).
The enhanced hydrologic and flood forecasting system will be integrated into the FEWS. This involves extensive reconfiguration efforts of the information flows in and out of the models. A dissemination system will be designed together with the Nile Water Department and relevant stakeholders, and its implementation and configuration carried out by the TA team.
The system will be hosted at DHI's servers for a period of 2 years to create a time window for the Ministry to purchase and install their own hardware, so that the system can be transferred to their premises, the transfer will be done with DHI's assistance. Therefore, the assumption that the Ministry has access to ENTRO software licenses is key as a new installation at DHI's servers will need to be made.

Deliverables	Delivery date
Model calibration and validation report	13 October 2023

Activity 2.2 – Review and improvement of the overall performance of the system

The forecast model must show that it is simulating the historical conditions (in terms of flow and water levels) with accepted accuracy and computational efficiency. This mainly focuses on the model evaluation by comparison of historical observations and forecasts with simulated data series at various locations. In assessing the forecasting performance, goodness-of-fit measures are presented as the average magnitude of the errors as a function of lead time over the evaluation period for select key locations. Improvement of the system performance will depend highly on the quality of the time series data in
Table 3.
During a period of 9 months, the trained operators will run the FEWS system and report on any issues and difficulties observed. It is anticipated that a dedicated communication process during this period with the TA implementer may be established e.g., through the initiation of interactive emailing on a regular basis (twice a month).

The TA implementer will provide the Nile Water Department with recommendations of what actions should be prioritized targeting the future improvement of system performance specifically.

Deliverables	Delivery date
Enhanced FEWS operationalized	17 November 2023

Activity 2.3 – Technical manual update

The existing technical manual will be updated in accordance with system alterations carried out.

Deliverables	Delivery date
Updated technical manual	17 November 2023 (and 6 May 2024)

Output 3. Strengthened capacity and sustainability for uptake and effective use of the upgraded FEWS

Activity 3 – Capacity building for use of the enhanced FEWS

Activity 3.1 – Production of training materials

The CTCN TA implementer will produce materials for the online and face-to-face training sessions of system operators as well as for the stakeholder workshop for FEWS product end users.

Deliverables	Delivery date
Training materials	17 November 2023

Activity 3.2 – Training of government bodies and stakeholders for use of the system

The selected system operators will receive training in the usage and operation of the system. The proposed format is a face-to-face 5-day training session for a maximum of 12 participants, assuming active involvement of the designated staff on use of the forecasting system. Online ad-hoc assistance via email will be available for the duration of Activity 3.

Deliverables	Delivery date
In person training session and remote support	11 December to 15 December 2023, and during December 2023 to June 2024

Activity 3.3 – Stakeholder workshop for FEWS product end users

A broader range of selected relevant stakeholders, from those already identified during the activities of Outputs 1 and 2, will be trained in the application of the FEWS products as determined by the Nile Water Department. This will be done via a 1-day workshop for a maximum of 25 participants, these may be the same as the inception workshop participants. Active involvement of the proponent is expected in the organization of the workshop in support of the project manager similarly to the Inception workshop (for example chairing, sending official invitations and contributing to the agenda).

At the end of Activity 3 an encompassing Capacity enhancement report will be produced, describing the outcomes of the technical training and the end user workshop as well as participants feedback and evaluation.

Deliverables	Delivery date
FEWS product end user workshop	20 June 2024
Capacity enhancement report	28 June 2024

Activity 3.4 – Preparation of the closure report

As required by the CTCN TA implementation guidelines, the technical assistance closure report will be prepared and submitted.
A period of 2-years maintenance is included to cover costs of keeping the system online at DHI's infrastructure, plus time up to a day for assistance by IT expert to install the system at Sudan's premises, once the country has purchased and installed their own hardware and supporting IT infrastructure during that period.

Deliverables	Delivery date
Technical assistance management documentation	26 July 2024
2-years of maintenance of the final system using DHI's infrastructure and transfer of the system	Post-project

Appendix 1: Detailed Schedule

Appendix 2: Budget

Activity	Notes	Quantity	Unit	Unit Cost ($)	Total Cost ($)
Activity 1: Stakeholder consultation, assessment of available data and existing FEWS					
Activity 1.1: Project initiation and kick-off meeting					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*3*	*Person day*	*1,263*	*3,790*
Expert 2	*Flood Modelling Expert*	*1*	*Person day*	*1,263*	*1,263*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*1*	*Person day*	*1,304*	*1,304*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***6,358***
Sub-total activity 1.1					***6,358***
Activity 1.2: Data collection and stakeholder consultations					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*3*	*Person day*	*1,263*	*3,790*
Expert 2	*Flood Modelling Expert*	*2*	*Person day*	*1,263*	*2,527*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*2*	*Person day*	*1,304*	*2,608*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***8,925***
Sub-total activity 1.2					***8,925***
Activity 1.3: Inception workshop					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*6*	*Person day*	*1,263*	*7,581*
Expert 2	*Flood Modelling Expert*	*0*	*Person day*	*1,263*	*-*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*0*	*Person day*	*1,304*	*-*
Expert 4	*Gender Expert*	*4*	*Person day*	*380*	*1,520*
Component sub-total					***9,101***
Travel					
Ticket for Expert 1	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1350*	*1350*
DSA for Expert 1	*DSA Khartoum*	*6*	*DSA*	*165*	*990*
Ticket for Expert 4	*Local travel*	*1*	*Ticket*	*400*	*400*
DSA for Expert 4	*DSA Khartoum*	*2*	*DSA*	*165*	*330*
Ticket for national stakeholders	*Local travel*	*25*	*Ticket*	*400*	*10000*
DSA for national stakeholders	*DSA Khartoum*	*25*	*Day*	*165*	*4125*
Workshop	*Rental meeting room and catering*	*1*	*Day*	*150*	*150*
Workshop	*Lunches and coffee breaks*	*1*	*Day*	*150*	*150*
Component sub-total					***17,495***
Sub-total activity 1.3					***26,596***
Activity 1.4: Review of the collected data					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*2*	*Person day*	*1,263*	*2,527*
Expert 2	*Flood Modelling Expert*	*2*	*Person day*	*1,263*	*2,527*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*2*	*Person day*	*1,304*	*2,608*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***7,662***
Sub-total activity 1.4					***7,662***
Activity 1.5: Model and FEWS review					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*1*	*Person day*	*1,263*	*1,263*
Expert 2	*Flood Modelling Expert*	*4*	*Person day*	*1,263*	*5,054*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*4*	*Person day*	*1,304*	*5,216*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***11,533***
Sub-total activity 1.5					***11,533***
Activity 1.6: Capacity needs assessment					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*6*	*Person day*	*1,263*	*7,581*
Expert 2	*Flood Modelling Expert*	*0*	*Person day*	*1,263*	*-*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*0*	*Person day*	*1,304*	*-*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***7,581***
Travel					
Ticket for Expert 1	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1350*	*1350*
DSA for Expert 1	*DSA Khartoum*	*6*	*DSA*	*165*	*990*
Component sub-total					***2,340***
Sub-total activity 1.6					***9,921***
Sub-total activity 1					***70,995***

Activity	Notes	Quantity	Unit	Unit Cost ($)	Total Cost ($)
Activity 2: Enhancement of the FEWS					
Activity 2.1: Expansion and improvement of the FEWScomponents					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*0*	*Person day*	*1,263*	*-*
Expert 2	*Flood Modelling Expert*	*10*	*Person day*	*1,263*	*12,635*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*10*	*Person day*	*1,304*	*13,040*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***25,675***
Sub-total activity 2.1					***25,675***
Activity 2.2: Review and improvement of the overall performance of the system					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*4*	*Person day*	*1,263*	*5,054*
Expert 2	*Flood Modelling Expert*	*12*	*Person day*	*1,263*	*15,162*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*12*	*Person day*	*1,304*	*15,648*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***35,863***
Sub-total activity 2.2					***35,863***
Activity 2.3: Technical manual update					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*2*	*Person day*	*1,263*	*2,527*
Expert 2	*Flood Modelling Expert*	*2*	*Person day*	*1,263*	*2,527*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*2*	*Person day*	*1,304*	*2,608*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***7,662***
Sub-total activity 2.3					***7,662***
Sub-total activity 2					***69,200***

Activity	Notes	Quantity	Unit	Unit Cost ($)	Total Cost ($)
Activity 3: Capacity building for use of the enhanced FEWS and planning for sustainability					
Activity 3.1: Production of training material					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*4*	*Person day*	*1,263*	*5,054*
Expert 2	*Flood Modelling Expert*	*2*	*Person day*	*1,263*	*2,527*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*2*	*Person day*	*1,304*	*2,608*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***10,189***
Sub-total activity 3.1					***10,189***
Activity 3.2: Training of government bodies and stakeholders for use of the system					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*7*	*Person day*	*1,263*	*8,844*
Expert 2	*Flood Modelling Expert*	*7*	*Person day*	*1,263*	*8,844*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*7*	*Person day*	*1,304*	*9,128*
Expert 4	*Gender Expert*	*5*	*Person day*	*380*	*1,900*
Component sub-total					***28,716***
Travel					
Ticket for Expert 1	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1,350*	*1,350*
DSA for Expert 1	*DSA Khartoum*	*6*	*DSA*	*165*	*990*
Ticket for Expert 2	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1,350*	*1,350*
DSA for Expert 2	*DSA Khartoum*	*6*	*DSA*	*165*	*990*
Ticket for Expert 3	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1,350*	*1,350*
DSA for Expert 3	*DSA Khartoum*	*6*	*DSA*	*165*	*990*
Ticket for Expert 4	*Local travel*	*1*	*Ticket*	*400*	*400*
DSA for Expert 4	*DSA Khartoum*	*5*	*DSA*	*165*	*825*
Ticket for national stakeholders	*Local travel*	*12*	*Ticket*	*400*	*4,800*
DSA for national stakeholders	*DSA Khartoum*	*60*	*Day*	*165*	*9,900*
Workshop	*Rental meeting room and catering*	*5*	*Day*	*150*	*750*
Workshop	*Lunches and coffee breaks*	*5*	*Day*	*150*	*750*
Component sub-total					***24,445***
Sub-total activity 3.2					***53,161***
Activity 3.3: Stakeholder workshop for FEWS product end users					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*7*	*Person day*	*1,263*	*8,844*
Expert 2	*Flood Modelling Expert*	*0*	*Person day*	*1,263*	*-*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*0*	*Person day*	*1,304*	*-*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***8,844***
Travel					
Ticket for Expert 1	*Round trip ticket from Copenhagen to Khartoum*	*1*	*Ticket*	*1,350*	*1,350*
DSA for Expert 1	*DSA Khartoum*	*7*	*DSA*	*165*	*1,155*
Ticket for national stakeholders	*Local travel*	*25*	*Ticket*	*400*	*10,000*
DSA for national stakeholders	*DSA Khartoum*	*25*	*Day*	*165*	*4,125*
Workshop	*Rental meeting room and catering*	*1*	*Day*	*150*	*150*
Workshop	*Lunches and coffee breaks*	*1*	*Day*	*150*	*150*
Component sub-total					***16,930***
Sub-total activity 3.3					***25,774***
Activity 3.4: Preparation of a project closure report					
Personnel					
Expert 1	*Project Manager and Hydrologist*	*0.5*	*Person day*	*1,263*	*632*
Expert 2	*Flood Modelling Expert*	*0*	*Person day*	*1,263*	*-*
Expert 3	*Flood Forecasting and Operational Systems Expert*	*0*	*Person day*	*1,304*	*-*
Expert 4	*Gender Expert*	*0*	*Person day*	*380*	*-*
Component sub-total					***632***
Sub-total activity 3.4					***632***
Sub-total activity 3					***89,756***
Sub-total					**229,951**
Operation and maintenance cost					**18,000**
Mandatory audit cost					**2,000**
TOTAL BUDGET					***249,951***